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OLEATE OF MERCURY AND MORPHIA.

BY CHARLES RICE.

This combination, suggested by Prof. John Marshall, F.R.S., and first prepared by Mr. Frank Clowes, has been in considerable demand in this city, but its preparation offers some difficulties, which do not seem to have occurred to Mr. Clowes, owing to a difference either in the character or quality of the solvent, or in the manipulation.

In using pure oleic acid as a solvent for oxide of mercury no difficulty is encountered, the oxide—both the red and the yellow varieties—being completely soluble in it, without any, or with only a very slight reduction to the metallic state.* This is not the case, however, with the commercial oleic acid, at least that which I have been able to procure in this city. It is, like the English, a residuary product in the manufacture of stearin candles, commercially termed "Red Oil," has a deep sherry-wine color and a peculiar greasy odor; exposure to moderate cold causes the separation of a considerable amount of solid acids, consisting chiefly of palmitic acid. Its sp. gr. is 0.895 at 62° F. This substance certainly dissolves the oxide of mercury, but it requires a greater degree of heat than the pure acid to effect the solution, while at the same time some of the oxide is invariably reduced to the metallic state, owing to the presence of some readily oxidisable impurities in the acid, or perhaps due to the oxidation of the acid itself. The amount of reduction is in direct proportion to the degree of temperature employed, as might have been anticipated, and was proved by a number of experiments:

* The only objection to the employment of the pure acid is its high price.

192 grains of oxide of mercury, corresponding to 177·7 grains of metallic mercury, heated with ten times the weight of oleic acid, gave the following reductions :

At 300° F.	amount of reduced Hg,	. . .	175 grains.
At 280° F.	"	"	152 "
At 212° F.	"	"	69 "
At 200° F.	"	"	35 "

Between 200° and 180° F. the amount of reduction varied between 20 and 40 grains, according to shorter or longer exposure to heat ; but I have been unsuccessful in effecting a solution unaccompanied by reduction, This makes it necessary to estimate the strength of each fresh lot of solution.

The strength of the preparation as prescribed by different physicians has varied from twenty per cent. to two per cent. of oxide of mercury, with variable quantities of morphia ; but of late a uniform strength of six per cent. of oxide of mercury and two per cent. of morphia is deemed sufficient for most purposes, and the following is the process which I employ for its preparation :

Expose the commercial oleic acid to a temperature of 40–50° F., and express the liquid portion, which is oleic acid, deprived of the greater portion of the accompanying solid acids. Take of oleic acid, prepared as above, 1536 grains ; oxide of mercury, perfectly dry, 192 grains. Rub the oxide in a mortar with some of the oleic acid to a smooth paste ; add the remainder of the acid ; place the mortar on a water bath, and promote solution by frequently stirring, taking care not to allow the temperature to exceed 200° F.

As soon as all the oxide has disappeared, or rather as soon as the undissolved residue is of a pure gray color, remove the mortar from the water bath and allow it to stand for twenty-four hours. Then pour off the clear solution into a tared capsule ; wash the residue thoroughly with ether and add the washing to the liquid in the capsule. Expose the latter to a very gentle heat, until all the ether has evaporated and weigh. The residue, after being properly washed and carefully dried (without heat), may be weighed as metallic mercury, which is in practice sufficiently correct.

Supposing the weight of the obtained solution to be 1698 grains and the weight of the reduced mercury to be thirty grains (assuming therefore that there has been no loss incurred during heating and during the subsequent washing of the residue, whilst in practice a

small loss always occurs), we first calculate the amount of HgO_2 , to which the thirty grains Hg correspond :

$$\begin{aligned} 200 \text{ Hg} : 30 &= 216 \text{ HgO}_2 : x \\ x &= 32.4 \text{ grains.} \end{aligned}$$

The solution, therefore, weighing 1698 grains, only contains 159.6 grains of HgO_2 , or 9.4 per cent.

This solution is now to be reduced to the strength of six per cent. by the addition of more oleic acid, until it weighs 2660 grains, but we also want two per cent. of morphia. The balance wanting ($2660 - 1698 = 962$ grains) is obtained by dissolving fifty-three grains of morphia in 909 grains of oleic acid and adding it to the first obtained solution of 1698 grains, making a dark brownish red liquid, of sp. gr. 0.975 at 60° F , and containing six per cent. (159.6 grains) of HgO_2 , and two per cent. (53 grains) of morphia.

It is scarcely ever used for the purpose of producing the constitutional effects of mercury, but rather as a resolvent for articular ankylosis, and it has produced excellent effects in cases of chronic articular rheumatism and in gout, by removing the stiffness and producing flexibility of the joint.

New York, Nov. 18, 1872.

Since the above was written, I have succeeded in obtaining a sample of oleic acid in this city, which dissolves the oxide completely, and, if previously separated by cooling from the solid acids, does not produce the least reduction. I also found that a much lower degree of heat is sufficient to effect solution, ($160^\circ - 180^\circ \text{ F}$). A lot of oxide of mercury mixed with half its weight of carbonate was employed in a few instances, and gave even better results than the oxide alone. The resulting product, made with this kind of oleic acid, is of the consistence of thin cream and of a light brownish yellow color.

A sample of the English oleic acid, expressly imported by a friend, gave invariably a greater or lesser reduction, and so do all the other varieties which I have hitherto tried, with the exception of the last. As soon as I have traced the latter to its source I shall not fail to make it known.

New York, Dec. 15, 1872.

UNGUENTUM ZINCI OXIDI.

BY ALFRED H. BOLTON.

In making oxide of zinc ointment by the official process I have experienced great difficulty in making a smooth ointment, which difficulty prompted me to resort to some other method of manipulation. The idea of using the paint-mill suggested itself to me. Now as paints are brought to a fine and smooth condition by the use of the mill, I thought why could not the oxide of zinc ointment be manipulated in the same way? In the way of experiment a paint-mill was obtained, and the result of my trial was a success; the ointment thus made is perfection in every respect. I proceeded as follows:

Placed the lard in a capsule and applied heat until fluid; then added the oxide of zinc; removed from the fire and stirred it occasionally until it acquired a semi-fluid consistence; then benzoinated it with tincture of benzoin, (made in the proportion of three troy-ounces to eight fluid-ounces of alcohol), using four fluid-drachms to every troy pound of the ointment, which preserves it from rancidity. I introduced the lard and zinc thus prepared into the mill, previously warmed, and passed it through, regulating the mill by the use of a thumb-screw attached to the same, and keeping the ingredients at the same consistence by the use of a spirit lamp placed underneath the mill. The use of a spirit lamp is superfluous in summer, and in a warm room in winter. The oxide of zinc ointment, which most pharmacists experience so much trouble with, can be made in this way perfectly smooth, and with a great deal less labor than rubbing it on the ointment slab as some do. The cost of a mill may be an objection to some, but for those who prepare large quantities of zinc ointment, I think it worth the price of a mill.

A perfect ointment is always admired by the pharmacist, the physician and the patient who uses it. This ointment is used largely by every practitioner of medicine, and deserves to be prepared in the best possible manner. In summer time the addition of two troy ounces of white wax to a troy pound of the ointment gives it a better consistence. The ointments of carbonate of zinc, carbonate of lead and others, might be prepared in a similar manner.

Philadelphia, December, 1872.

SUPPOSITORY MOULDS OF PLASTER PARIS.

BY CHARLES E. DWIGHT.

Pharmacists who have had many suppositories to make with the old moulds have undoubtedly often hurt their fingers by pounding in trying to remove the suppositories. I have been for some time using a mould which parts through the centre and is made of plaster Paris, which gives so much satisfaction that I can but wish for others to try it; it may have been used by others, but is entirely original with myself.

The expense of buying moulds of metal which part through the centre has probably been detrimental to their universal use, while they are undoubtedly superior to those old finger smashers in being easily cleaned and oiled, and also facilitating the extraction of the suppositories when cold. For the benefit of those unused to the manipulation with plaster, I will give a general plan for preparing the moulds.

Into a vessel of about six inches long by two wide and one deep, (a pasteboard box will do), pour in plaster mixed to the consistency of thick cream, until half full; have ready six suppositories, moulded of wax, from other moulds of good shape, and while the plaster is yet soft immerse them to half their diameter, with their large end close to the edge of the box, all in a row and a uniform distance apart. When the plaster has set, gently remove the wax, and with a knife smooth off the surface and trim the edges of each mould sharp, and between each depression made by the wax suppository dig a small cavity about the size and shape of a small pea cut through the centre. Now we have half of our mould. When the face has become hard, oil or grease with linseed oil or lard, replace the wax suppositories and raise the edges of the box by wrapping heavy paper around, which will extend about another inch above the surface of the face; mix another portion of the plaster equal to the first, and in the same way, and gently pour over the greased surface until it will be about one inch deep above the other or lower half. When hard, the two parts can be easily pulled apart, the edges trimmed off and each part boiled for about an hour in linseed oil, which will prevent the adhesion of the substance to be moulded. The plaster must be mixed thin and well stirred to be substantial.

By following the above plan almost any number of sizes can be

made at small expense, and will, I think, be found to answer admirably. If this will in any way alleviate the frown which comes over the face of the pharmacist when he finds he has to make suppositories, the object of the writer will be fully attained.

Wheeling, W. Va., Nov. 28, 1872.

ELIXIRS.

By C. G. POLK, M. D.

Within the last six or eight years a class of pharmaceutical products termed elixirs have acquired extensive use and grown into an undeserved popularity, both with physicians and the community at large. But while purporting to be definite solutions of officinal and well esteemed remedies, they are as varying in their constituents as the proprietary bitters, and of really less value than some of them. In appearance, articles bearing the same name vary in hue from an inky blackness to the color of officinal syrup, with almost every intermediate tint. Their taste is as different as their color, but in therapeutical value they generally agree; most of them being utterly worthless.

The whole thing is radically wrong and strikes at the very foundation of rational pharmacy. In the first place the articles are so numerous that they must modify the action of the principal article to a degree that envelops the therapeutical result in mystery, and leads the physician to grope in darkness and uncertainty to an extent as great as though he were using Scheitz's or Hostetter's Bitters. Secondly, it is morally wrong to tamper with human health and rob the sick of their money without an equivalent benefit. Thirdly, they are the creations of private formulas, many of which are unknown to any one else than the manufacturer, and are practically proprietary medicines. Fourthly, they are a flag of truce to homœopathy initiatory to a surrender, without half the therapeutic merit of aconite, belladonna, pulsatilla, bryonia and veratrum, even homœopathically administered. Fifthly, they are not what they profess to be. They are base frauds. Most of the elixirs of calisaya are nothing more than a finely flavored solution of sulphate of cinchonia in proportion of about half a grain to the ounce, and do not contain the least trace of any other alkaloid of the cinchona bark. The ferrated elixirs generally contain the stated amount of the citrated iron in which their virtues mainly consists, but

even these have no advantage over a syrup of the citrate of iron properly flavored, and are often not as good.

The tinctura cinchonæ comp., well prepared, with fresh orange peel and combined with compound tincture of cardamom and syrup to meet each individual case, is preferable to any elixir I have ever seen for general use. If iron and quinia are desired, the citrate of the two in combination may be given in pilular form or in a finely flavored syrup combination.

Bromide of potassium may be administered with compound tincture of cardamom, which nearly conceals its disagreeable taste, and the iodide of potassium given in syrup, compound tincture of cardamom and Curaçoa cordial can be taken without difficulty. The bitter taste of quinia may also be nicely concealed by a similar combination, so that a grain may be administered in dessert-spoonful doses. *An elixir of copaiba containing half a drachm in half an ounce of the menstruum, and so covered with aromatics as to be palatable, would be really a pharmaceutical triumph!* but one which has not yet been gained.

The evils of the elixirs are recognized, deplored and condemned by the better class of physicians and pharmacists, and yet the remedy is plain. Make them officinal, strip them of their novelty, and adopt formulas that every retail druggist can follow. Uniformity of strength, taste and appearance would be established; only one bottle of each would be required; physicians prescriptions could always (when they are ordered), be filled in letter and spirit, and all the mist and uncertainty which now envelop elixirs would be cleared away, and a class of remedies well suited for infant therapeutics would be at least definite in their constituents, convenient for physicians and druggists, easy to administer and reliable in their action. Those miserable go-betweens of homœopathy on the one hand and quack remedies on the other would either cease to exist or become patent medicines, sold by printer's ink.

It has been suggested by several pharmacists that there be a simple elixir, to be used as a menstruum, wherever it is necessary to cover the taste of disagreeable medicines. Although several objections can be urged against any formula I could offer, either of my own emanation or have seen offered by others, I doubt not that pharmaceutical skill can supply this great desideratum.

But however much I may condemn the wholesale quackery into

which the elixirs have been run, I do not wish to be understood as condemning them in toto. Valerianate of ammonia is so disagreeable in odor and taste as to be neglected for these, unless they be covered, and the formula in the United States Dispensatory does this sufficiently well to render it available, and could assafoetida also be covered in taste and smell without interference with its therapeutical action, one of our best nervines and anti-spasmodics would come into general use.

I hope that this subject will receive the consideration of more able and experienced minds, and a great evil be remedied.

Philadelphia, Pa.

SOLANIA IN SOLANUM LYCOPERSICUM.

BY GEORGE W. KENNEDY.

Having had a strong desire to know whether or not the common tomato plant (*Solanum lycopersicum*) contained any solania, and never having seen any analysis of the plant, I was induced to make a series of experiments. The fruit of the plant has been examined by several pharmacists, but I believe there was no solania discovered. The amount of citric acid obtained by the experimenters has varied very considerably, thus suggesting that the fruit of different varieties has been examined, or that the fruit was collected at different periods of the year.

In giving the result of my examination I hope it may give a little more light on a plant of some importance, which I have found to contain the alkaloid solania. The process for extracting the alkaloid was similar to that of Wackenroder, except a slight change in the maceration and in using ammonia instead of hydrated lime for precipitation.

I took a quantity of the living plant, leaves and stems, and bruised them with water into a pulp in a mortar. This pulpy mass is next macerated for forty-eight hours with water enough to cover it, previously acidulated with sulphuric acid so as to have a strong acid reaction. The liquid is then expressed, and the residue treated again with sulphuric acid and water, as in the first maceration. It is now expressed as before, the two liquids are mixed, and, after standing for some days, filtered and treated with water of ammonia, sp. gr. 0.960, in excess. The precipitate that forms is separated by straining dried

in heated air at 120° F, and then boiled several times with alcohol. The alcoholic solution, having been filtered while hot, will, upon cooling, deposit the solania in small feathery-like crystals, resembling quinine in appearance, having a smell like that of potatoes, and a taste rather nauseous, bitter and somewhat sweetish. With sulphuric acid, it gives a bright red color, passing into reddish brown. With iodine a characteristic yellowish brown color is produced. Besides solania, I also found in the herb some fixed oil, gum, chlorophyll and inorganic salts.

Pottsville, Dec. 2, 1872.

ON SOME IMPURITIES IN THE COMMERCIAL RHIZOME OF CYPRIPEDIUM.

BY JOHN M. MAISCH.

Read at the Pharmaceutical Meeting, held Dec. 17th.

In a paper read before the pharmaceutical meeting, held in April last, I called attention to the fact* that two different rhizomes are met with in commerce under the name of cypripedium or ladies' slipper. Through the kindness of several readers of the American Journal of Pharmacy, I was subsequently enabled to convince myself that the two plants furnishing the commercial article are *Cypripedium pubescens*, Willd. and *C. parviflorum*, Salisb., of the rhizomes of which I gave a short description.† I then stated that the rhizomes and rootlets of these two species are the only ones constituting the commercial article, with which I have had but a limited acquaintance and experience, and the commercial specimens obtained several years ago for my cabinet prove the correctness of my observation.

Recently, however, Mr. G. L. Truckenmiller, a student of this college, directed my attention to an admixture with the rhizome of *Hydrastis canadensis*, Lin., which he had observed in commercial cypripedium, stating that an herbalist of this city had informed him that it was almost impossible to collect the latter free from the former, since the two plants grew together in the same localities, and their interwoven rootlets rendered the separation of the two rhizomes extremely difficult.

The two species of cypripedium prefer bogs and marshes, but are

*American Journal of Pharmacy, 1872, p. 194. †Ibid, 297.

said to be also found in rich low woodlands, in localities in which hydrastis grows. I have observed this latter plant to be pretty frequent in some localities in the mountains of the northeastern section of Schuylkill County, Pa., but did not find any cypripedium there, and it seems to me as if hydrastis could hardly grow in swamps, where the other plants probably thrive best.

However this may be, it is a fact that occasionally, at least, cypripedium is mixed with a considerable proportion of hydrastis, which may escape detection on superficial examination, particularly if *Cypripedium parviflorum* has been principally collected, the color of the rhizome of which is a brownish grey, resembling the yellowish grey of the corky layer on hydrastis, while the rhizome of *Cypripedium pubescens* has a blackish brown color externally. There is, however, no difficulty in distinguishing the admixture by its growth, as well as by its structure and color internally. *Cypripedium parviflorum* has the cup-shaped scars of the overground stems directly upon and above the rhizome, which is hollowed out considerably and bent zigzag up and down; hydrastis has an oblique rhizome, with very distinct nodes, and bears the stem scars upon short but distinct branches, of which only the older ones have concave or cup-shaped terminations. It breaks with a short fracture, exhibiting a resinous lustre and a reddish to brownish yellow color in which the eight to twelve almost linear light yellow ligneous rays are distinctly visible, enclosing an orange yellow pith. The rhizomes of both species of cypripedium break likewise short, parviflorum usually circular, pubescens often nearly two-edged upon the fracture, which has little lustre, is white, almost mealy in appearance, and, with the scattered bundles of ligneous tissue, very indistinct. The rootlets exhibit a similar difference, those of hydrastis being bright yellow, with a central ligneous cord of a quadrangular or triangular shape.

In another specimen of ladies' slipper root, some senega and roots of other dicotyledonous plants, not further determined, were observed.

It appears from the foregoing that the pharmacist must exercise care in selecting ladies' slipper root for medicinal use, lest it may be contaminated with other medicinal and non-medicinal roots to such an extent that garbling may be too tedious and expensive an operation.

CERESIN A SUBSTITUTE FOR WHITE WAX.

BY JOSEPH P. REMINGTON.

Read at Pharmaceutical Meeting of Philadelphia College of Pharmacy.

A sample of this article was put into the writer's hands for the purpose of examination. It had been sent to a large manufacturing house in Philadelphia from an agent in Germany, with the intention of introducing it here as a substitute for beeswax.

In appearance it is very similar to white wax, in a flat cake, white, shining, nearly inodorous, breaking shortly with a fracture like wax. Its specific gravity is .850, and its fusing point 135° F., volatilizable by heat, and the sublimed ceresin is reddened by the application of sulphuric acid; it dissolves slowly in ether, phenol, turpentine, petroleum-benzin, chloroform, carbon bisulphide, and freely in these solvents, if heated, depositing in gelatinous white flocks on cooling, nearly insoluble in alcohol and methylic alcohol. It is indifferent to the strong mineral acids, with the exception of hot sulphuric acid, which acts on it easily, forming a ruby red liquid, which rapidly passes to black with the evolution of sulphurous acid. This is due to the deoxidation of the sulphuric acid; its action is first to carbonize the ceresin, and the carbon then abstracts oxygen from the sulphuric acid, and sulphurous acid is liberated; neither potassa nor soda would saponify it. Prof. John M. Maisch kindly informed the writer of an account in Hager's Pharmaceutische Centralhalle, (Oct. 10th), of some of the properties of this substance. The points are as follows:

Ceresin—fusing point between 62° and 63° R. Acids and alkalies do not attack it either cold or hot.

At high temperature it volatilizes and distills without change.

Ceresin price in Vienna, 100 guilders.

Paraffin price in Vienna, 70 guilders.

Paraffin slowly cooled becomes opaque, and resembles wax more than if cooled rapidly.

Probably obtained from fossil wax (Erdwachs) of Galicia, which yields such a paraffin.

An imitation of yellow beeswax is in German commerce. It consists of paraffin, colored yellow by curcuma.

The Journal of Applied Science contains the following:

Ceresin is a new product, destined to play an important part as a

lighting material. It is obtained from ozokerit or fossil wax by the following process. Ozokerit is heated up to a temperature ranging from 250° to 300° C., in order to separate by volatilization and subsequent condensation the liquid oils. The mass being cooled down to 60° , it is treated with from 10 to 26 per cent of Nordhausen sulphuric acid. The temperature is then raised to 100° , and care is taken to maintain this heat until the precipitation of the carbon takes place and forms a viscous residue, which is carefully separated from the supernatant oils, heated and then treated with about 10 per cent of diluted sulphuric acid and afterwards neutralized by aid of an alkali. The mass is then heated to about 180° , poured upon plates and pressed through linen cloths in order to separate the greasy matters; this residue of wax can then be melted and filtered. The product is ceresin, which is employed in the manufacture of candles.

To summarize the results obtained by the writer, ceresin is undoubtedly one of the paraffins, although it differs from common paraffin in several respects. It is not unctuous to the touch, as is paraffin, is not as translucent and does not break with the characteristic fracture of paraffin, and has a higher fusing point, although the fusing point of paraffin is sometimes lower than 135° F. It seems to hold a middle place between paraffin and wax. It would serve as a substitute for wax in pharmacy in a number of cases. A very white and firm simple cerate was made with it, using it in the same proportion as wax—that is two parts lard, one part ceresin.

PERMANGANATE OF POTASSIUM—A MODIFIED FORM OF CRYSTAL.

BY JOSEPH P. REMINGTON.

Read before Pharmaceutical Meeting of Philadelphia College of Pharmacy.

A sample of permanganate of potassium was recently examined in which the prismatic character of the salt was almost entirely wanting. It was imported from Germany and offered in New York market. The crystals, when thrown into a heap, resembled a miniature pile of anthracite; the pyramidal summits were present on some of them, but in a number of cases this characteristic was absent. Tested volumetrically, a given portion of the solution was exactly decolorized by the requisite quantity of solution of ferrous sulphate, thus indicating a pure salt. The only explanation that is suggested to the

writer is that some foreign salts were presented in the solution from which it was crystallized, which interfered with their proper development.

On one occasion, in obtaining crystals from a large quantity of solution, 50 or 60 gallons, a similar effect was noticed, there being present in the solution, besides pure permanganate, chloride and sulphate of potassium. The crystals, on examination, proved to be the double salt of perchlorate and permanganate.

ADULTERATED HEAVY MAGNESIA.

BY RICHARD V. MATTISON.

A short time ago I had occasion to purchase a quantity of heavy magnesia, and the order was given one of our large wholesale houses to fill. The quantity sent me presented a fine appearance, and a portion of it was put up in 3i and 3ii packages for dispensing, some of which was returned with the remark, "There must be some mistake here; this does not taste like magnesia!" Upon examining a portion of the package presented I was struck with the peculiar taste, which was strongly saline and cooling, bearing some resemblance to that of tartaric acid when in combination with an alkaline base. Upon examining the remainder, which had not been placed in packages, it was found to be of the same character.

The physical properties of the powder, differing so widely from pure magnesia, suggested the propriety of a chemical investigation, and it was analyzed at the College laboratory, under the supervision of Prof. Maisch. The powder, submitted to the action of boiling water and the mixture filtered, gave a filtrate of a strong alkaline reaction with turmeric paper, and yielding no precipitate upon cooling; after the addition of ammonium chloride and oxalate, a slight turbidity was produced, indicating the presence of a little calcium. The magnesium salt dissolved was thrown out of the filtrate by the addition of solutions of ammonium hydrate and ammonium orthophosphate and boiling. The abundant precipitate produced by these reagents gave evidence that this almost insoluble alkaline earth had entered very largely into solution. This precipitate was removed by filtration, evaporated and calcined in a porcelain crucible with a few drops of nitric acid added occasionally, until reduced to whiteness, and all traces of ammonium had disappeared. The portion remaining in the

crucible was dissolved in water acidulated with hydrochloric acid, and the solution concentrated, when upon the addition of platinic chloride a precipitate of the double chloride of platinum and potassium was produced.

The mixed precipitate and supernatant liquid was evaporated to dryness, and yielded to a small portion of water a filtrate which colored the flame of a Bunsen burner a bright yellow, and gave a crystalline precipitate of sodium antimoniate, when a solution of potassium antimoniate was added.

As the original powder charred when placed upon platinum foil and heated, the presence of one of the organic acids was indicated, and another portion of the powder was boiled in water, filtered, and the magnesium salt separated as before. The filtrate from this produced a precipitate with barium chloride, partly soluble in nitric acid, showing the presence of a small quantity of sulphuric acid, probably existing in combination as sodium sulphate. With another portion of this filtrate argentic nitrate produced a white precipitate, soluble in solution of ammonium hydrate, and in nitric acid. This precipitate, upon being heated to 212° F., instantly blackened from the reduction of the silver.

To another portion of the filtrate solution of calcium hydrate was added, and a dense white precipitate was the result. This precipitate was soluble in solution of ammonium chloride, tartaric acid, and also in solution of potassium hydrate, from which, upon boiling, it was reprecipitated. This corroborative testimony proved the presence of tartaric acid, which existed, combined with potassium and sodium, as Rochelle salt in the powder, mixed with magnesia and imported for our market and sold under the name of *Heavy Magnesia*.

Philadelphia, Dec. 23, 1872.

GLEANINGS FROM THE EUROPEAN JOURNALS.

BY THE EDITOR.

Nitrate of silver and crystallized sugar, when acting upon each other, (at 130° C.), do not yield optically neutral sugar, as stated by Maumené. N. Borodylin obtained instead invert sugar and oxalate and cyanide of silver.—*Pharm. Zeitsch. f. Russl.* 1872, No. 17.

Analysis of Berberries.—Dr. Graeger found in 100 parts of the recently collected ripe fruit of *Berberis vulgaris*, Lin., exclusive of the

stalks, 15.58 integuments and seeds, 17.20 soluble solid constituents and 67.22 water. The constituents of the juice, calculated for 100 parts of fresh berries, are 5.92 malic acid, 4.67 sugar, 6.61 gum, 67.16 water and 0.06 salts of potassium and calcium. The integuments and seeds yielded 2.20 ashes, mainly consisting of phosphate of calcium. The berries are well adapted for the preparation of malate of calcium.—*N. Jahrb. f. Pharm.*, 1872, Oct. 201–203.

Hyoscyamia, according to Dr. G. Merck, is generally obtained in the form of a soft amorphous mass. If this mass is carefully distilled in a current of hydrogen, a colorless distillate is obtained, which is probably the pure alkaloid. It is a somewhat oily liquid, resembling conia in odor and appearance, readily soluble in alcohol and ether, also in water, partly soluble in benzin and chloroform; in contact with the air it rapidly becomes yellow and brown, acquires a thicker consistence and an intense disagreeable odor, and is then but partially soluble in ether. It has a strong alkaline reaction and neutralizes the acids completely. The salts are crystallizable with difficulty.—*Ibid*, 203, 204.

Depilatory.—Prof. Boettger recommends the following as safe: 1' part of crystallized sulphhydrate of sodium is rubbed to a very fine powder, and mixed with three parts of prepared chalk. The mixture keeps well in closed vials. Mixed with water and applied to the skin, the hair becomes soft in two or three minutes and is readily removed by water. A longer application is apt to corrode the skin.—*Ibid.*, p. 230.

[This appears to be an improvement on Boudet's depilatory, which consists of 3 parts of crystallized sulphhydrate of sodium, 10 parts of quick-lime and 10 p. of starch.—EDITOR.]

An unhurtful hair-dye is suggested by Dr. Hager, as follows: 10 parts of subnitrate of bismuth and 150 p. of glycerin are mixed in a glass vessel and heated in a water-bath; solution of potassa is then added in small portions and with continued agitation, until a clear solution has been obtained, to which a concentrated solution of citric acid is added until merely a slight alkaline reaction is observed. Enough orange-flower water is added to make the whole liquid weigh 300 parts; the addition of a small quantity of solution of an anilin color completes the preparation.—*Pharm. Centralhalle*, 1872, No. 46.

Peschier's Tapeworm Pills are made, according to Hager, of 1-6 grm. (25 grs.) each of oleo-resin and powdered male fern, divided into 20 pills, which are rolled in lycopodium, and taken 10 in the evening and the remaining 10 next morning. An hour after the last dose a clyster is given, consisting of 2 grm. oleo-resin of male fern, 15 grm. gum arabic, and sufficient water.—*Ibid.*, No. 47.

Death from the Inhalation of the Vapors of Phosphorus Paste.—An apothecary had poisoned several bushels of wheat with strychnia, which was to be used for the destruction of field-mice, but previously to be covered with phosphorus paste. Instead of performing the last operation in the open air, upon small quantities, the deceased worked upon the wheat, in two portions, in his cellar, and continued at this labor notwithstanding he fainted several times. The inhalation of the gases evolved prostrated him completely, and he died within a week.—*Pharm. Zeitung*, No. 96.

Potassa Soap for Soap Liniment and Liquid Opodeldoc is recommended by G. H. Barckhausen, on account of its perfect solubility in alcohol even at the freezing temperature. The commercial soft soap, however, is unfit for this purpose, because it contains variable quantities of free alkali, is often adulterated with starch, &c., and varies considerably in color. The author suggests the following manipulation: 100 parts of rape-seed oil are mixed, near the temperature of boiling water, with 15 parts of potassa, previously dissolved in some alcohol; the remaining alcohol is then added, and the digestion continued until the oil is dissolved, when the water is added, whereby the complete saponification is facilitated. This gives a slight excess of alkali, which, however, is necessary to avoid retaining unsaponified oil in the solution. Alcohol decomposes soaps when dissolving them, setting alkali free; hence less alkali is requisite if the soap is made in alcohol. Based on the amount of fatty acids, the author finds that 100 parts of rape-seed oil are equal to 300 p. potassa soap, or 150 p. Castile soap.—*Archiv d. Pharm.*, 1872, Oct., 289—299.

Decomposition of Dilute Hydrocyanic Acid.—Pettit states that aqueous hydrocyanic acid containing 10 per ct. of acid, decomposes very rapidly, while if dissolved in 1000 parts of water ($= \frac{1}{10}$ per ct. acid), it will keep for six months almost without alteration. If a 10 per ct. acid, which has already commenced to decompose, is diluted

to $\frac{1}{10}$ per ct., the alteration does not progress. Ammonia does not appear to induce this decomposition. Gautier, however, infers from his experiments with the concentrated acid that ammonia hastens the decomposition.—*Chem. Cent. Blatt*, 1872, No. 42, from *Bull. Soc. Chim.*

The action of iodoform and phosphorus produces, according to Gautier, an orange-yellow body, which is insoluble in most solvents, and yields with boiling water another lighter colored compound and the products of decomposition of tri-iodide of phosphorus. The new body is probably the phosphorus compound corresponding to cyanic acid.

Phosphorus does not re-act upon chloroform at a temperature of 200° C.—*Ibid.*

Action of Oxygen upon Aqueous Infusions.—Laborde filled a glass globe, the neck of which was drawn out to a fine point, with infusions and decoctions of vegetables, heated to boiling, and when the air was expelled closed the opening hermetically. The liquids remained unaltered while portions of the same liquids rapidly spoiled by mould when left in contact with the air. The generation of oxygen within the globe by means of electricity, did not cause any alteration, but mould appeared in a few days when contact with the atmosphere was re-established.—*Journ. de Pharm. et de Chim.*, 1872, Aug., 113.

Value of Apomorphia in Cases of Poisoning.—Dr. Loeb relates a case of poisoning of a young man who had swallowed a portion of a solution of 3 oz. oil of bitter almonds in $1\frac{1}{2}$ pint of strong alcohol. Half an hour afterwards the patient was found with a livid countenance, rational, but very weak, vision impaired, pulse 96, heat of body not altered. A subcutaneous injection of 0.008 grm. ($\frac{1}{8}$ gr.), produced emesis in 8 minutes, which was repeated in 5 minutes. The young man felt better at once, and was well the next morning, with pulse 72.—*Apoth. Zeitung*, 1872, No. 45.

ON THE DETERMINATION OF THE TRUE ZERO OF THERMOMETERS.

By CH. TELLIER.

It is generally admitted that the 0° of the Centigrade and Réaumur thermometers varies after a longer or shorter time, and the delicate and sensitive thermometers therefore become altered as regards

the indication of the 0° when placed in melting ice or snow. According to the observations on the supersaturation of water with cold (see *Chemical News*, vol. xxvi, p. 107) thermometers are much less variable than is generally supposed, and the cause of the differences which are observed is probably due to an error made in the determination of the 0° . It may be readily conceived that unless special precautions are taken at the time of the gradation of the thermometer, the water in which it is plunged, and which is supposed to be precisely at the temperature of melting ice, may in reality be slightly above that temperature; this is the case if the walls of the vessel containing the water and ice admit more heat to the water than the melting ice can overpower: this is natural; ice does not melt instantaneously, but only in the ratio of its surface, and in proportion to the difference of the temperature of the water in which it floats, and its own temperature; and it is consequently quite possible that the water which contains the ice is not at a temperature of 0° . The colder the water the more slowly will equilibrium of temperature be established between the two bodies, and in the same ratio will the chances of error be greater. The error of indications of the thermometers brought on by time either depends upon a modification in the glass, as usually admitted, or it is due to the result of an erroneous estimation of the 0° . In the first case the alteration would rather tend to *plus* in one case and *minus* in the other, and there is no plausible reason why it should be otherwise; in the second case (erroneous estimation of the 0°) the error should be always *plus*, because the water must be above 0° . My experiments have confirmed these views. I have taken seven thermometers with the gradations engraved on the stem and made by one of the best makers; only one of these instruments has been found to indicate 0° correctly, all the others indicated a difference—

2	indicated	+ 0.1
1	"	+ 0.2
2	"	+ 0.3
1	"	+ 0.4

Not one of these thermometers indicated below 0° .

The determination of the 0° by placing the thermometer in melting ice is therefore not an absolutely certain method of operating. In order to find the true 0° another plan must be followed, which is that found and described by me, and called *terminus of congelation*. The operation is carried on as follows:—A glass vessel is placed in a re-

frigerating mixture, and the temperature of the water contained in the vessel is thereby readily lowered to -2 or to -3 : this having been done, the vessel is removed from the mixture, and the thermometers to be graduated are placed in it, with a small piece of ice; hereby the water becomes suddenly frozen, while at the same time the temperature rises to 0° . When one has no ice at hand, and in order not to complicate the operation, the temperature of the water should be brought down to -4° , when, by giving a gentle tap with a glass rod to the bottom of the vessel, the phenomenon of congelation of the water will be observed, the temperature rising to the true 0° absolutely. I draw from the foregoing the two following conclusions:—

1. That the expression of melting ice does not exactly indicate the true 0° , and that therefore it ought not to be the basis of the determination of that point.

2. That by applying the term of *terminus* of congelation it is quite possible to estimate with certainty the exact point which separates liquid water from ice, and that point is the true 0° , which should be the starting point of the graduation of the thermometer scale.—*Revue Hebdomadaire de Chimie*.—*Chem. News*, 1872, Nov. 22.

TINCTURE AND SYRUP OF ORANGE-PEEL, AND TINCTURE OF QUININE.

BY CHARLES SYMES, PH. D.

The preparation of tincture of orange from fresh peel is a matter which has engaged my attention more or less during the last twelve years, and some few remarks on the observations I have made from time to time might not be out of place, especially as very vague conclusions appear to have been arrived at on this subject at the last Pharmaceutical meeting, after a description of some (to my mind) unsatisfactory experiments by the President.

On March 8th, 1868, I brought the subject before the members of the Liverpool Chemists' Association, exhibiting a sample of the preparation in question, and advocating its general adoption (*vide Pharmaceutical Journal*, 2d series, vol. IX, p. 522), but it received comparatively little attention, and it was overruled by Mr. Shaw (in the chair) that the inconvenience of being unable to obtain fresh peel at all seasons of the year was sufficient to justify the continuance of the process according to the B. P.

Tincture of orange is essentially a flavoring agent, possessing slight stomachic properties; nevertheless, it is the most important of its class, largely prescribed, and therefore meriting attention. In drying the peel, however carefully this is performed, a large percentage of the aroma is lost, which, if retained, makes a tincture of *unquestionably superior flavor*; such being the case, any difficulty in procuring the fruit at some seasons is quite secondary. How easy would it not be to make many of the tedious pharmacopœia preparations if we could rest satisfied with inferior results? When this tincture has been kept twelve months the flavor is not quite so fine as when freshly prepared, but even then its superiority to tincture from the dry peel is evident.

Six ounces of peel, cut thinly from the fruit, weigh two ounces when dry; it will be evident then that this quantity will be required to make one pint of tincture, and that four ounces of water must be omitted in making the proof spirit. Although rectified spirit might be the best solvent of the volatile oil, etc., in the peel, there is an objection to its use, as it tends to *harden* the peel, rendering it more crisp and less permeable. In the winter I usually make sufficient to carry me safely through the summer, when the fruit is difficult to procure, but taking the quantity of the pharmacopœia for example I proceed thus:—Six ounces of thin fresh peel, cut small, are macerated 48 hours with four ounces distilled water; 12 ounces of rectified spirit are then added, and the maceration continued with occasional agitation for one month; filtered, pressed, and the product made to measure one pint with proof spirit. Set aside in a moderately cool place for use.

TINCTURE OF QUININE, prepared from the foregoing tincture in the summer, deposits in the winter—so it frequently does when prepared with the B. P. tincture—presuming, of course, that pure quinine be used (not the unbleached, which frequently, if not always, contains cinchonine). Now, to prepare, say two pints, tincture suitable for comp. tincture of quinine, I proceed thus:—Take six ounces fresh peel, two ounces dry peel (in fine shreds, known as machine cuttings), add four ounces water, and after forty-eight hours, 32 ounces *rectified spirit*; allow to stand as before, but, after pressing, make up the deficiency with *rectified* instead of proof spirit. Thus a tincture is obtained of fine flavor, and capable of retaining the quinine in solution. Here it might be objected that I am introducing a third strength of

spirit, and with its complication. This is to some extent true, and I should be the last to do so if no practical results were to be gained, but it must have occurred to many persons as being somewhat inconsistent that in the B. P. we should have but two strengths of spirit (and these more or less arbitrary) as being best capable of dissolving and preserving the active principles of the whole materia medica.

SYRUP OF ORANGE PEEL.—Most of what I have written with regard to the tincture from fresh peel will apply to the syrup made from that tincture, but with this exception, it does not lose anything of its fine aroma by age. Sugar appears to possess a preservative influence, and this suggests an experiment worth trying when Seville oranges are again in season, viz.:—Take the six ounces of fresh peel and beat well with an ounce or two of sugar, before adding the water and spirit for producing the tincture; will it retain its fresh flavor quite unchanged?—*Pharm. Journ. and Trans.*, Nov. 16, 1872.

THE PRESENCE OF SILVER IN COMMERCIAL SUBNITRATE OF BISMUTH.

BY CHARLES EKIN, F. C. S.

In the June number, 1868, of the *Pharmaceutical Journal*, will be found a short paper of mine on "Commercial Bismuth," in which I pointed out that, whilst the tests given in the Pharmacopœia for bismuthum purificatum excluded copper, and the process for purifying it eliminated arsenic and antimony, no notice was taken of the probable presence of silver, notwithstanding that it was known that commercial bismuth frequently contained silver.*

My attention was again called to the matter by receiving the other day from a well-known and highly respectable firm of manufacturing chemists a sample of subnitrate of bismuth, containing so much silver that when exposed to the light it became of a deep bluish-black tint. I obtained a sample from another firm of at least equal standing as manufacturing chemists, and to my surprise I found that even this too contained a very appreciable amount of silver. Upon this I decided to investigate the matter further, and obtained samples from four of the first dispensing houses in the country, for examination.

Each sample was dissolved in nitric acid, diluted with an equal volume of water, the insoluble residue, if any, was collected on a filter, well washed first with diluted nitric acid, and afterwards with water, and then treated on the filter with ammonia. The presence of silver

* See American Journal of Pharmacy, 1871, p. 292.

was considered sufficiently proved by the residue on the filter being blackened by exposure to light, by its being soluble in ammonia, and giving in its ammoniacal solution a light lemon colored precipitate, with iodide of potassium. The chloride was precipitated from the nitric acid solution and weighed as chloride of silver in the usual way. In no case did diluted sulphuric acid give any precipitate, thus showing the absence of lead.

Sample 1. The one first mentioned above. A very short exposure to light blackened it. Was not examined further, as the manufacturers acknowledged the contamination of silver.

2. The second sample mentioned above contained much less silver than sample 1, but sufficient to give a distinct bluish tint when exposed to light for two or three days.

3. Not a subnitrate at all, but a basic subchloride, containing chlorine equal to 90 per cent. of BiOCl ; not completely soluble in nitric acid, and contained silver.

4. Contained silver and 3.9 per cent. of subchloride.

5. Contained traces of subchloride, but no silver.

6. Traces both of subchloride and silver.

7. Neither silver nor subchloride.

8. Contained silver and 4.9 per cent. subchloride.

9. Neither silver nor subchloride.

10. Silver and traces of subchloride.

11. Neither silver nor subchloride.

12. No silver, but 6.5 per cent. subchloride.

13. No silver; traces of subchloride.

14. No silver; about one per cent. subchloride.

15. Neither silver nor subchloride.

The samples showed great diversity in density and appearance. Sample No. 1 was a damp powder, having a strongly acid smell and reaction. I am assured by manufacturers that subnitrate prepared strictly according to the Pharmacopœia, after having been kept for about two months, develops so much acid as actually to effervesce with carbonates. After rewashing, however, it becomes more basic and more stable.

In sample No. 3, obtained from a London dispensing house, the substitution by the manufacturer of a subchloride for a subnitrate is of course unpardonable. I have understood that, owing to its being prepared at a less cost, there is a great deal of subchloride sold as subnitrate, but this is the first sample I have ever met with.

The subchloride in the other samples, although in one instance it amounts to as much as 6.5 per cent., I consider to be rather the work of careless manufacture than an adulteration. It would appear that after the bismuth is dissolved, the silver, which, as we have seen, must be frequently present, is precipitated as chloride by hydrochloric acid, and removed by decantation. If this is done carefully, there could be no objection to such a process, but that it is not generally done carefully is sufficiently proved by the presence of varying quantities of subchloride, and in seven samples out of fifteen, of chloride of silver. Samples 7, 9 and 11, which are very pure, I find, on inquiry, were manufactured by Howards & Sons, Stratford.—*Pharm. Journ. and Trans.*, Nov., 16, 1872.

NEW METHOD OF PREPARING CHROMIC ACID.*

By E. DUVILLIER.

The chromate of barium is decomposed at a boiling heat, with an excess of nitric acid. The almost insoluble nitrate of barium is precipitated in a crystalline form, and chromic acid remains in solution. The latter is purified by successive evaporations, and by finally treating with a suitable quantity of dilute sulphuric acid.

The process is as follows: Boil for ten minutes 100 parts chromate of barium, 100 parts water, 140 parts nitric acid, sp. gr. 40° B.

The water should first be poured on the chromate of barium to form a kind of magma, and the nitric acid added afterward. This is important, because, if the opposite order is followed, the result is not as good, and the nitrate of barium formed incloses in it chromate of barium.

To the red liquor add 200 parts of water, and allow it to boil for ten minutes. The nitrate of barium settles rapidly when left quiet.

The supernatant liquid, when cold, contains 4 parts of nitrate of barium to 100 of soluble substances. This is decanted and evaporated to nearly the volume of the acid used. During this operation the greater part of the dissolved nitrate of barium is precipitated, and when the liquid cools chromic acid is obtained, containing only 0.5 per cent. of nitrate of barium.

The excess of nitric acid is expelled by evaporating nearly to dry-

* Translated for the Journal of Applied Chemistry from Dingler's Polytechnisches Journal.

ness, adding water, and repeating the operation several times, until a stopper with ammonia no longer gives white fumes. The sufficiently concentrated chromic acid crystallizes in black warts, exactly similar to the plates obtained in a vacuum by Bolley's method. In this way chromic acid, sufficiently pure for most uses, can be prepared in a few hours.

To obtain a perfectly pure product it is only necessary to precipitate the remainder of the barium by adding a sufficient quantity of sulphuric acid to the boiling solution.

This method possesses the advantage over all those previously described of quickly furnishing all the chromic acid contained in the chromate of barium used, and also that the acid is absolutely pure. It can also be employed on a large scale by observing the above-given proportions. The excess of acid would then be collected in a suitable distilling apparatus so as to use it for another operation. The nitrate of barium could be used in making the chromate of barium, so that no loss would be sustained.

CHLOROFORM AS SOLVENT FOR AND MEANS OF SEPARATING POISONOUS VEGETABLE SUBSTANCES IN FORENSIC INVESTIGATIONS.

I. Nowak has instituted a series of experiments which prove that chloroform quickly and perfectly extracts the following long list of vegetable substances from alkaline solutions, viz.: Strychnia, quinia, quinidia, chinchonia, caffeina, theobromina, emetina, atropia, hyoscyamia, aconitina, veratrina, physostigmia, narcotina, codeina, thebaina, nicotina and conia. It dissolves brucia, colchicia and papaverina more slowly. Sabadillia is only taken up by it when warm, while narceina is taken up from alkaline solutions in small quantities only. Picrotoxin is acted upon by chloroform more readily from acid than alkaline solutions. Morphia and solania do not dissolve in chloroform, either from acid or alkaline solutions.

Further experiments also show that all those substances which are taken up by chloroform from aqueous alkaline solutions are again given up by it on shaking repeatedly with acidulated water, while fatty and other foreign substances mixed with them remain in the chloroform. A systematic course of search for poisonous vegetable substances, founded upon the above facts, was instituted, and its practicability tested by actual experiments as follows: A weighed quantity

of different poisons was mixed with pieces of flesh selected for the purpose, and then tested for. The results obtained showed that in many cases the whole quantity of the poison mixed with the flesh was recovered, and in most cases the greater part was found. The results gave general satisfaction, especially on account of the great purity of the alkaloids obtained from the chloroform, so that the reactions for identifying them could be made at once.—*Journ. App. Chem., Dec., 1872.*

VANILLIC ACID.*

By P. CARLES.

After being preserved for a certain time vanilla generally becomes covered with crystalline needles. As this crystallization is considered to be a mark of good quality, sometimes it is sought to impart it to inferior vanilla, and this is done by simply putting some of the crystals already formed into the case containing it. The chemical composition of this efflorescence does not, however, appear to be perfectly understood.

Formerly, and the error has been repeated in recent works, Vogel asserted that it consisted of benzoic or cinnamic acid; Wittstein thought it to be coumarin. M. Vée,† comparing the melting-points of these various substances, detected the error and showed that it was a peculiar acid. About the same time, M. Gobley‡ investigated the chemical characters of these crystals, compared them with coumarin, and proposed for them the name vanillin, or aromatic principle of vanilla. Later, in Germany, Stokkebye§ took up the subject. He fixed the melting-point at 82° C., instead of 76° C. (Gobley), or 78° C. (Vée), and in virtue of its acid properties called it vanillic acid. Finally, while Gobley had attributed to it the formula $C_{20}H_6O_4$, Stokkebye represented it by $C_{34}H_{22}O_{20}$ || These differences in the formulæ and melting-points attributed to it seemed to show that even if their authors examined the same crystals, they were at least not of equal purity. M. Carles was therefore induced to undertake the present investigation.

Instead of extracting the vanillic acid directly from the vanilla, M.

* Abstract of paper in *L'Union Pharmaceutique*, xiii, 294.

† *Journ. de Pharm. et de Chimie*, [3] xxxiv, 412.

‡ *Ibid.*, 404.

§ *Zeitschrift für Chemie*, 1865, p. 467.

|| These formulæ are according to the old notation.

Carles preferred to purify the deposit found at the bottom of the cases in which vanilla had been kept. From a mixture of specimens from various sources he made a concentrated aqueous solution by boiling, and after the addition of animal charcoal, passed it through a moistened filter. Upon cooling, the acid was deposited, and it was submitted to two or three successive crystallizations. If cooled slowly the crystals appeared as colorless transparent prisms, sometimes more than two centimetres long. When fresh and very pure their odor was very feeble, but was increased by heat, and their taste was piquant. Vanillic acid, so obtained, melts at between 80° C. and 81° C. Heated on platinum foil, it volatilizes without decomposition, but it distils with difficulty in a retort at about 280° C. It is very soluble in cold alcohol, ether, chloroform, sulphide of carbon, and the fixed and volatile oils. Water at 15° C. dissolves 1.2 per cent., but in boiling water it is very soluble. It decomposes the bicarbonates with effervescence; and saturates perfectly the alkaline bases in the cold, and the earth bases with heat. Pure concentrated sulphuric acid turns it yellow in the cold, but if the acid contain traces of nitric acid a scarlet color is produced, and the same result follows with pure sulphuric acid and resinous crystals. Dilute nitric acid attacks it feebly, but concentrated quickly converts it into oxalic acid. Chlorine, bromine, and iodine yield products of substitution. It is precipitated by acids from concentrated aqueous or alcoholic alkaline solutions with little evident modification, even after being exposed for several hours to a temperature of 100° C. It colors the persalts of iron blue, reduces nitrate of silver and is precipitated plentifully by the acetates of lead. Its formula is given by M. Carles as $C_{16}H_8O_6$ ($C_8H_8O_3$).

	Found.		Calculated.	
	I.		II.	
Carbon, . . .	63.14		63.13	63.15
Hydrogen, . . .	5.55		5.69	5.26

The author describes the following compounds of vanillic acid obtained by him :

Vanillate of Lead ($C_{16}H_7PbO_6$).—Tufts of white crystals radiating from a common centre, deposited upon cooling after mixing a hot aqueous solution of vanillic acid and a solution of neutral acetate of lead.

Vanillate of Magnesia ($C_{16}H_7MgO_6$).—Colorless, inodorous crystals

slightly soluble in cold water, insoluble in alcohol and ether. Obtained easily by double decomposition between fresh vanillate of baryta and sulphate of magnesia, or by saturating a boiling solution of vanillic acid with magnesia hydrate or carbonate, and allowing to cool slowly.

Vanillate of Zinc ($C_{16}H_7ZnO_6$).—Deposited in white crystals upon cooling a hot solution of vanillic acid, saturated by oxide or carbonate of zinc. Slightly soluble in boiling water.

Iodine Compounds ($C_{16}H_7IO_6$ and $C_{16}H_6I_2O_6$).—The first consisting of white pearly crystals of faint odor, slightly soluble in alcohol and ether, melting at 74° and subliming without decomposition, was deposited after some hours from a mixture of 2 grams of vanillic acid dissolved in 50 grams of water and 1.5 gram of iodine dissolved in 50 grams of alcohol. The second was obtained when iodine was used in excess, also as pearly crystals. It is slightly soluble in boiling water, insoluble in cold chloroform, soluble in hot ether and alcohol.

Bromine Compound ($C_{16}H_6Br_2O_6$).—Pearly, yellowish, odorless crystals, very slightly soluble in water, more so in alcohol, ether and chloroform, obtained by gradually adding slight excess of bromine to a concentrated aqueous solution of vanillic acid, and crystallizing the precipitate first from alcohol and then from boiling water.

Vanillic acid being ignited with potash, and the mass afterwards treated with water, hydrochloric acid and ether yielded small white inodorous prismatic crystals, which product the author considers to be a new acid and proposes to call oxyvanillic acid, with the formula $C_{18}H_8O_8$. When vanillic acid was heated in a sealed tube with hydriodic acid, the methyl-hydriodic was obtained.

From these experiments M. Carles is led to conclude that the efflorescence on vanilla is neither of the substances that have heretofore been described, but is a peculiar acid, isomeric with anisic, formobenzoic, methylsalicylic, creasotic, oxytoluic, and many other acids.—*Pharm. Journ., Lond., Nov. 23, 1872.*

DESCRIPTION OF A NEW QUINIMETRIC PROCESS.

BY P. CARLES.

Having ascertained, by experiment, that the quinimetric methods in use are not suited for extracting, in a sufficiently pure state to admit of

weighing, all the quinia contained in the cinchona barks (the decoction method extracts coloring matter and changes the active principles, while the lixiviation process yields very weak liquors, in which a portion of the alkaloids are kept in solution), I have devised a method which may be carried out as follows:—A good average sample of the bark is ground to powder, and passed through a fine horse-hair sieve; 20 grms. of this powder are intimately mixed with from 6 to 8 grms. of slaked lime, mixed with 35 grms. of water, and the mixture of quina bark and pasty lime dried at a gentle heat; the cake thus formed is reduced to a coarse powder and pressed into a conically-shaped glass tube (or a funnel with stop-cock and glass stopper); chloroform is then gradually poured on to the contents, care being taken to cork the tube at the top; 150 grms. of chloroform will be a sufficient quantity, but it is best to ascertain if the bark is exhausted by evaporating a few drops of the last portion of the chloroform in a porcelain basin; the residue should be treated first with dilute sulphuric acid, and next with chlorine water and ammonia. The chloroform which adheres to the mixture of lime and bark is displaced by the addition of water, and the fluid is next evaporated upon a water-bath until a dry residue is left. If desired to save the chloroform, it can be distilled off in a retort upon a water-bath: the distillation should not, however, be carried on to dryness, but the remainder of the fluid is to be evaporated to dryness in a porcelain capsule, and then treated with dilute sulphuric acid. The solid dry residue consists of the alkaloids of the bark, mixed with about their own weight of waxy-resinous (*céreo résineux*) matters; the alkaloids are taken up by dilute sulphuric acid (1 to 10), of which fluid from 10 to 12 c. c. are sufficient. This solution is filtered through a very small, previously moistened, filter, and the filtrate is colorless; the filtrate is next heated to 100° upon a water bath, and, when hot, ammonia—at first concentrated, afterwards dilute—is added, so as to cause the filtrate to become very nearly saturated,—to be left very slightly acid; all the quinia will then crystallize in the shape of sulphate. This crystallization proceeds rapidly, and the peculiar odor emitted by the fluid, as well as the aspect of the crystals, are of some value in ascertaining beforehand the quality of the bark operated upon. When the liquid has become completely cold the crystalline matter forms a solid cake, which has only to be placed upon a double filter for the purpose of draining: the mother-liquor is displaced by a few drops of water,

after which the mass is gently pressed, dried, and weighed.* If the mother-liquor is found to be very acid, ammonia in slight excess should be added, for the purpose of precipitating the rest of the quinia. The other alkaloids remain in solution, and are next separated by precipitation, dried, weighed and tested with washed ether.

This process is simple and expeditious, and yields good results, the quinia being obtained in a colorless state. I quote the following instances of its working:—(1). A mixture was taken of pure sulphate of quinia, 0.60; cinchonia, 0.20; dilute sulphuric acid (1 to 10), 10 c.c.; while hot I poured, by means of a pipette, first concentrated and then dilute ammonia nearly to saturation: result obtained—sulphate of quinia, 0.59; cinchonia, 0.22. (2). Sulphate of quinia, 0.50; cinchonia, 0.25: acid at $\frac{1}{10}$, 10 c. c., found sulphate of quinia 0.52; cinchonia, 0.17. A. Yellow cinchona bark, 20 grms. has yielded per 1000, by the use of Roubourdin's modified process (see *Journ. de Pharmacie*, 1861), strongly-colored crystalline sulphate of quinia, 23.00; with Le Maitre's process, somewhat yellow-colored sulphate of quinia, 22.30; with my process, colorless sulphate of quinia, 26.55. B. Yellow cinchona bark, same quantity, by Roubourdin's process, strongly colored crystallised sulphate of quinia (per 1000), 29.50; Le Maitre's process, yellow-colored sulphate, 26.75; my process, colorless sulphate, 31.25. Trials with other kind of bark yielded similar results, but I should mention that the separation of the quinia as sulphate only succeeds well when the quantity of quinia in the bark greatly exceeds the cinchonia.

To exhibit the effect of an excess of cinchonia I quote the following:—Sulphate of quinia, 0.40; cinchonia, 0.60; acid $\frac{1}{10}$, 10 c. c., yielded—sulphate of quinia, 0.58 (mixed with cinchonia); cinchonia, 0.48: the impure sulphate of quinia thus obtained may be purified, re-crystallised and tested with ether and ammonia.

As sulphate of quinia is completely insoluble in a solution of sulphate of ammonia, there is no fear of any of the sulphate of quinia being left in the mother-liquor if the saturation with ammonia is sufficiently complete. To prove this experimentally, take a small quantity of sulphate of quinia, shake it up in a test-tube three parts filled with cold distilled water, filter and add to the filtrate a few crys-

* It is preferable to dry at 100°, and, after having weighed, to add the 12 per cent of water lost by the operation; in that condition it contains 75 per cent. quinia.

tals of sulphate of ammonia. After a few minutes the liquid will become a pasty mass: this is filtered, and not a trace of sulphate of quinia is found in the filtrate.—*Chem. News*, Nov. 8, from *Bull. Soc. Chim., Paris*.

COCHINEAL PRODUCTION IN CENTRAL AMERICA*.

The insect is preserved during the winter upon branches cut off from the cactus, and ranged in long, narrow buildings, called *almacenes*, erected for the purpose. The roof of these buildings is from a yard to a yard and a-half wide, and for the first six weeks the front, which is open, is covered with a screen made of cotton cloth, to protect the young insect from a sort of fly that lays an egg among them, which in a few days turns into a caterpillar, and does a great deal of mischief, devouring a large quantity of the young animals; after that period they are left open to the sun and air. It is so arranged that the insects begin to breed in the beginning of October, about which time the rains cease in Amatitlan, though somewhat later in the vicinity and most other parts of the State. The insect is carefully removed from the cactus as soon as it begins to deposit its young, and put into small, square pieces of muslin, calico, or the bark of a description of palm-tree, the latter being cheaper and much more preferable for the month of October, as it does not fall together when damp, like a cotton fabric. The four corners are pinned together with the thorn of a bush (a species of *Mimosa*), which is very abundant in the neighborhood. After about a hundred of the insects have been put in, one of these packets, called by the natives *cartuche*, is attached to each leaf or two, or one to each side between two leaves, which latter method is generally preferred. If the weather is fine and warm, the insect breeds so quickly, that in a few hours each leaf contains a sufficient quantity of the small insect, when the bag must be removed and attached to another leaf; for if it is left too long, the leaf becomes too thickly covered with young insects, which, from being so numerous cannot obtain nourishment, and never attaining the proper size, produce, when dried, a small grained and very inferior cochineal called *granilla*, which is not worth more than half the price of the proper quality. As the cactus is always planted in rows of a certain length, it is usual to cover at one time the leaves of one or more rows with the bags containing the mother insect, and

* Abridged from the Journal of Applied Science.

when they are sufficiently covered with the young animal, called *peojillia*, to remove and attach them to other rows of cactus. This may be done once every day, if the weather is fine; but if it is windy and cold, they have often to remain three or four days without moving, for the wind blows away the insects as they creep out of the bag, and prevents them from attaching themselves to the leaves. The insect does not breed so fast if the weather is chilly, and a large portion is often killed on the leaves; even a heavy dew will destroy many at the first stage. In the October seeding in Amatitlan, when it is never required to load the plant, the weather being fine, and the mother cochineal in a thriving state, the bags may often be shifted ten or twelve times before it has done breeding; but if the weather be at all unfavorable, or the mother cochineal in a sickly state, or too soon or too late gathered, it cannot be shifted nearly so often.

When the mother cochineal has done breeding, or when the young insect begins to be sickly and of a dark red color, the bags are taken off, and their contents shaken out and dried in the sun; and when sifted, they form what is denominated in the country *zaccatilla*, and in England "black cochineal," which always fetches a higher price than the silver cochineal, the name given to it when the insect is dried before commencing to breed. During the first stage of its growth, as already remarked, the young insect is very easily injured; but when about ten days old, it is not nearly so easily destroyed. Still, as heavy showers of rain sometimes occur in October, it is nothing rare for the cochineal grower to find nearly all his labor and outlay lost, and a great part of his crop destroyed in a few minutes; but when such misfortunes occur, all the growers suffer nearly equally, consequently the price is enhanced, and the loss is in some degree compensated by the increased value of what remains. In Amatitlan, such accidents only occur to the first crop, seeded in October, the greater part of the produce of which is always used for seeding the cochineal estates in old Guatemala in the month of January, and, when the crop is not large, fetches a much higher price than it would be worth if dried for exportation. In about twenty days after the young insect has attached itself to the leaf, it changes its skin, which is called the first *muda* (change or transformation); and in about a month more it again undergoes the same process, at each of which periods it slightly shifts its position on the leaf. At the time of the second change the male makes its appearance in the shape of a very small

fly, but how it is produced is, strange to say, not quite determined. All the natives, and even the foreigners, in Guatemala, who state that they have made experiments for the purpose of ascertaining it, assert that it is produced by the female at the second change—that is to say, about the middle of its growth; but this would appear quite impossible from all data in natural history.

I had not leisure to make proper experiments, but an intelligent North American gentleman, a doctor by profession, who had done so, informed me, that previously to, and some time after the second transformation or casting of its skin, the male and female insects are nearly equal in number, and cannot be distinguished on the leaf; but, that about fifteen days after the first transformation, all the male grubs change into chrysalids, interring themselves in a downy covering, and weaving a small thread, let go their hold of the leaf, and hang by it for about fifteen days more, when the female is in the second change. About this time the chrysalis hatches, and the male makes its appearance as stated; and almost immediately after impregnating the female, falls off the leaf and dies. When the smallest quantity of rain occurs about this period, the males are washed off before the females are impregnated, and the insect is barren.

In from eighty to ninety days, according to the nature of the weather, the cochineal insect attains its full growth in Amatitlan, and commences to breed. It is then left upon the leaf long enough to produce a sufficient quantity of young insects for the second crop, which attach themselves to the same leaves, and in the same manner as the first; and the full-grown insect is removed by touching it with a small piece of cane, and offered for sale in flat baskets, each containing about twelve pounds weight of the insect. The greater part of the crop is sent, as before stated, to Old Guatemala for the purpose of seeding the cochineal estates there. This process is nearly identical with that of the October seeding, in Amatitlan, already described, only that a larger quantity of the insects are allowed to attach themselves to the leaves; and some parties attach the mother cochineal in small pieces of reed instead of bark or cloth.

In Old Guatemala all the cochineal estates are seeded but once in the year, from the beginning of the month of January to the middle of February; but as the climate there is considerably colder than in Amatitlan, the insect does not obtain its full size, so as to be fit for gathering, in less than a hundred days after it has attached itself to

the plant; and as the rainy season often commences in the beginning of May, a great part of the crop is frequently lost by being washed off by the rains before it is fit for gathering. In Amatitlan the second crop is ready for getting in eighty days after the first has been gathered, and is therefore always got in before the rains commence, which certainly gives it great advantages over Old Guatemala; but the second crop is always much smaller grained and worth considerably less than the first. Labor is also much dearer in Amatitlan than Old Guatemala, and an estate of equal extent costs at least twice as much to keep it in order—the wages in the former place being $2\frac{1}{2}$ to 3 reals (equal to 1s. 3d. to 1s. 6d.) per day, and in the latter, $1\frac{1}{2}$ reals (equal to 9d). Beside this, the cactus and cochineal insect have a number of enemies in Amatitlan which do not exist in Old Guatemala. The principal injury to the former is sustained from a species of large ant, called senpope, which eats all the young shoots of the cactus, so as to prevent its increasing. The nests of this insect are very large, and sometimes extend to a depth of twenty feet in the ground, along which they run for some fifteen or twenty yards, and the insects are often so numerous, that if let alone they will entirely destroy a cochineal estate. The natives have no means of destroying them, except digging them out of the ground; and though I discovered a means of poisoning them by pouring into their holes water in which a small quantity of corrosive sublimate had been dissolved, I do not suppose that the discovery will generally be made use of by the inhabitants, who are too stupid and ignorant to understand anything not palpable to the eye.

The principal enemies of the cochineal insect are three sorts of caterpillars, called by the natives "gusanos" (worms); the most common resembles an ordinary caterpillar, and is produced from the egg of a small fly, in shape like a wasp, but without a sting. These are sometimes so numerous that two or three may be seen on each leaf of the cactus, and if not speedily taken off, will, in a month—the period of their existence—eat up nearly all the cochineal insects. Another sort spin a web, with which they entangle the insect and destroy it; and the third, called "anguilla" (the eel), which is by far the most destructive, moves over the leaf like an earthworm, eating all the insects, when small, with surprising rapidity, and transferring itself to another leaf, proceeds as before. Luckily this last mentioned species only makes its appearance in some years, and is never nearly so numerous as the first named. No means have yet been found of de-

stroying these caterpillars, except employing people to pick them off, which is done at so much for every twenty grubs, according to their abundance or scarcity, the price being seldom under what is equivalent to a half-penny for each twenty, or above one penny for that number. Still, when the grubs are very numerous, it is sometimes necessary to abandon the crop of cochineal, which is not worth the expense of picking off the caterpillars; this of course is, however, a rare occurrence, and never happens to the whole of an estate of any size.

With all its objections cochineal growing has certainly been more profitable in Amatitlan than in Old Guatemala, or any other place yet discovered. Nearly all the cultivators in Amatitlan are well off, and many who were without means a few years ago, are now rich for Central America, having a fortune of from 10,000 to 30,000 dollars; while nearly all who have attempted the cultivation in Old Guatemala have been ruined, and very few have realized any money. Still the supposed fatality of the climate of Amatitlan has so great an effect as not only to raise enormously the price which must be paid to the workpeople to induce them to do the necessary labor, but keeps the value of cochineal estates rather lower than in Old Guatemala.

The second crop of cochineal is fit for gathering in Amatitlan from the end of March to the 20th of April; and the crop in Old Guatemala from the middle of April till the 10th or 20th of May, according to the season. Nearly the whole of both these crops are dried and cleaned for exportation to Europe, of which they are the principal source of supply. But a small number of insects are preserved, and being put into small bags, similar to those before described, are attached to leaves carefully ranged upon shelves under the long narrow buildings, called *almacenes*, the leaves being seeded in a similar manner to the growing plants. The insects attain their full size and commence to breed again in about ninety days, which brings it to the month of July, when those so reared are gathered and attached in the same manner to fresh leaves of the cactus, ranged under cover as before; this crop is again ready for gathering in the month of October, when the rains cease in Amatitlan, and is sold for seeding the cochineal estates. The price being regulated by the supply, as compared with the demand, is but little affected by the value of dry cochineal; the live insect being always then worth at least three or four times its value in the months of April or May, when it is dried for exportation. A good cochineal estate requires, in the month of October, from 100

to 140 pounds of the live mother insect to seed each *mansana* of 100 Spanish or 89½ English yards square, and each pound of the insect so used ought, if the weather be good and all circumstances favorable, to produce 8 lbs. in the crop time. The January seeding in Old Guatemala being much heavier, as only one crop is there taken, from 150 to 170 lbs. are generally used to seed each *mansana*. In Amatitlan, the first crop collected in January generally yields from 800 to 1,200 lbs. of the live insect from each *mansana* of cactus in a really good estate, which is sold at from 2½ to 8 reals (1s. 3d., to 4s. sterling) a pound, according to the demand and the abundance of the crop, &c., but the first crop is, one year with another, calculated to pay all the expenses of weeding and managing the estate, and the cost of the seed cochineal insect and labor of seeding it, &c. The second crop is always dried, and each *mansana* will yield from 1,800 to 2,700 lbs. of the insect and from 600 to 900 lbs. of dry cochineal, which is considered to be the net profit of the cultivation.

In Old Guatemala, each *mansana* ought to give 3,150 to 4,050 lbs. of the live insect, and 1,050 to 1,350 lbs of dry cochineal; three pounds of the live insect yielding as nearly as possible one of dry cochineal.

The cost of production in Old Guatemala one year with another, allowing for the current losses from rain, &c., is rated at 4 reals (or 2s. sterling) per pound. The cochineal insect, when not intended for breeding, is, as soon as gathered, spread out very thin upon flat shallow trays made of cane and covered with cotton cloth, and put into stoves constructed on purpose, each capable of containing from 100 to 200 baskets, and either heated by burning charcoal put into large clay vessels made on purpose, or by a small brick flue into which wood can be put and lighted from the outside (the former method is the most costly and tedious, but gives the finest colored cochineal). When completely dry it is sifted, cleaned and packed in bales covered with an untanned ox-hide, containing 150 lbs., in which state it is sent to Europe for sale. During the wet season a cochineal estate requires almost constant attention in cleaning and keeping down the weeds, and this must be done at least five times in the year in Amatitlan, or the cactus will be injured; though in Old Guatemala not more than two or three cleanings are given. The cactus must also be pruned at least twice in the year, once at the commencement of the rearing season in May, to make it sprout strongly, and again at the commencement of the dry season in October, when it is necessary to re-

move the long shoots, which would by their weight break down the cactus, and to trim the plants so as to give them an equal weight and form.

Varieties.

The International Exposition at Vienna, Austria, which will take place during the coming summer, is attracting considerable attention throughout the United States. The following, which we copy from the "Journal of Applied Chemistry," has special reference to that group which will contain the crude articles and manufactured products of the drug business, and which, it is to be hoped, will not lack in variety and completeness:

At a meeting of citizens of New York, convened upon invitation of General Thos. B. Van Buren, United States Commissioner, to devise measures to promote the objects of the approaching Exhibition at Vienna in 1873, it was resolved to appoint an *Advisory Committee*, to consist of one member for each group, upon whom should devolve the duty of arousing public attention to the importance of securing a creditable representation of the resources and products of the United States in Austria.

The undersigned, having been requested to take charge of the Department of Chemical Industry, begs leave to call the attention of all persons interested in the subject to the classification of the Austrian Commissioners given below, and to solicit specimens for transmission to Vienna, in the event of an appropriation being made by Congress to pay the expenses of transportation.

CLASSIFICATION OF THE IMPERIAL COMMISSIONERS.—GROUP 3.—CHEMICAL INDUSTRY.

- (a) Chemical products for technical and pharmaceutical purposes—acids, salts, chemical preparations of all sorts.
- (b) Raw substances and products of pharmacy, mineral waters, &c.
- (c) Fats and their products—stearin, oil acids, glycerin, soaps, candles and tapers, &c.
- (d) Products of dry distillation, as refined petroleum, slate oil, paraffin, phenylic acid, benzin, anilin, &c.
- (e) Etherial oils and perfumeries.
- (f) Matches, &c.
- (g) Dyestuffs, mineral and organic.
- (h) Resins (washed, dyed or bleached), sealing wax, varnish, albumen, isinglass, glue, starches, dextrin, &c.
- (i) Contrivances and processes used in chemical productions.
- (k) Statistics of production.

Application for permission to exhibit, inclosing statistics of production, should be addressed to General Thos. B. Van Buren, United States Commissioner, No. 51 Chambers street, New York, or to Charles F. Chandler, Ph. D., Chairman of Group 3, Advisory Committee, School of Mines, Columbia College, Forty-ninth street, corner Fourth avenue, New York.

The following gentlemen will be consulted upon questions relating to Chemical Industry.

Dr. M. Alsberg, Brooklyn, N. Y.	Prof. James C. Booth, Philadelphia, Pa.
Prof. J. H. Appleton, Providence, R. I.	C. Elton Buck, Esq., Wilmington, Del.
Prof. Geo. F. Barker, New Haven, Ct.	Prof. G. C. Caldwell, Ph. D., Ithaca, N. Y.
William T. Blodgett, Esq., New York	Prof. W. H. Chandler, Bethlehem, Pa.

- Prof. Albert H. Chester, E.M., Clinton, N. Y.
Bela P. Clapp, Esq., Pawtucket, R. I.
Peter Cooper, Esq., New York.
Prof. R. Ogden Doremus, New York.
Prof. Silas H. Douglass, Ann Arbor, Mich.
Samuel Downer, Esq., Boston, Mass.
Prof. John C. Draper, New York.
William Duryea, Esq., New York.
Edward P. Eastwick, Esq., Boston Mass.
Prof. A. E. Foote, Ames, Iowa.
Prof. F. A. Genth, Philadelphia.
G. W. Gesner, Esq., New York.
Prof. Wolcott Gibbs, Cambridge, Mass.
Prof. C. A. Goessman, Amherst, Mass.
Wm. M. Habirshaw, Esq., New York.
James L. Harway, Esq., New York.
S. Dana Hayes, Esq., Boston, Mass.
Prof. B. S. Hedrick, Washington, D.C.
Prof. Eugene W. Hilgard, Ph.D., Oxford, Miss.
Joseph Hirsh, Esq., Chicago, Ill.
Charles W. Hull, Esq., New York.
Prof. S. W. Johnson, New Haven, Ct.
Prof. Charles A. Joy, New York.
Martin Kalbfleisch, Esq., Brooklyn, N. Y.
M. Lacour, Esq., New York.
Jas. F. Magee, Esq., Philadelphia, Pa.
Prof. Jno. M. Maisch, Philadelphia, Pa.
Prof. John W. Mallett, University of Virginia, Va.
Joshua Merrill, Esq., Boston, Mass.
R. G. Mitchell, Esq., New York.
Dr. James R. Nichols, Boston, Mass.
Prof. John M. Ordway, Boston, Mass.
C. C. Parsons, Esq., St. Louis, Mo.
H. Pemberton, Esq., Natrona, Pa.
Charles Pfeizer, Esq., New York.
Prof. W. B. Rising, Oakland, Cal.
Carl. H. Schultz, Esq., New York.
Prof. Paul Schweitzer, Columbia, Mo.
Prof. Chas. A. Seely, New York.
Prof. B. Silliman, New Haven, Conn.
Prof. J. Lawrence Smith, Louisville, Ky.
Dr. Edward R. Squibb, Brooklyn, N.Y.
Prof. F. H. Storer, Roxbury, Mass.
B. Tilghman, Esq., Philadelphia, Pa.
Prof. S. D. Tillman, New York.
Dr. John Torrey, New York.
John Tracy, Jr., Esq., New York.
David K. Tuttle, Ph.D., Baltimore, Md.
Dr. Isidor Walz, New York.
Prof. Cyrus M. Warren, Boston, Mass.
William Weightman, Esq., Philadelphia, Pa.
Prof. T. G. Wormley, Columbus, Ohio.
Prof. Henry Wurz, New York.

The International Exposition at Philadelphia in 1876.—The United States Centennial Commission has issued the following address relating to the contemplated international exposition :

To the People of the United States:—The Congress of the United States has enacted that the completion of the One Hundredth Year of American Independence shall be celebrated by an International Exhibition of the Arts, Manufactures and Products of the soil and mine, to be held at Philadelphia, in 1876, and has appointed a Commission, consisting of representatives from each State and Territory, to conduct the celebration.

Originating under the auspices of the National Legislature, controlled by a National Commission, and designed as it is to "Commemorate the first Century of our existence, by an Exhibition of the Natural resources of the Country and their development, and of our progress in those Arts which benefit mankind, in comparison with those of older Nations," it is to the people at large that the Commission look for the aid which is necessary to make the Centennial Celebration the grandest anniversary the world has ever seen.

That the completion of the first century of our existence should be marked by some imposing demonstration is, we believe, the patriotic wish of the people of the whole country. The Congress of the United States has wisely decided that the Birth-day of the Great Republic can be most fittingly celebrated by the universal collection and display of all the trophies of its progress. It is designed to bring together, within a building covering fifty acres, not only the varied productions of our mines and of the soil, but types of all the intellectual triumphs of our citizens, specimens of everything that America can furnish, whether from the brains or the hands of her children, and thus make evident to the world the advancement of which a self-governed people is capable.

In this "Celebration" all nations will be invited to participate ; its character

being International. Europe will display her arts and manufactures, India her curious fabrics, while newly opened China and Japan will lay bare the treasures which for centuries their ingenious people have been perfecting. Each land will compete in generous rivalry for the palm of superior excellence.

To this grand gathering every zone will contribute its fruits and cereals. No mineral shall be wanting; for what the East lacks the West will supply. Under one roof will the South display in rich luxuriance her growing cotton, and the North, in miniature, the ceaseless machinery of her mills, converting that cotton into cloth. Each section of the globe will send its best offerings to this exhibition, and each State of the Union, as a member of one united body politic, will show to her sister States and to the world how much she can add to the greatness of the nation of which she is a harmonious part.

To make the Centennial Celebration such a success as the patriotism and the pride of every American demands will require the co-operation of the people of the whole country. The United States Centennial Commission has received no Government aid, such as England extended to her World's Fair, and France to her Universal Exposition, yet the labor and responsibility imposed upon the Commission is as great as in either of those undertakings. It is estimated that ten millions of dollars will be required, and this sum Congress has provided shall be raised by stock subscription, and that the people shall have the opportunity of subscribing in proportion to the population of their respective States and Territories.

The Commission looks to the unfailing patriotism of the people of every section, to see that each contributes its share to the expenses, and receives its share of the benefits of an enterprise in which all are so deeply interested. It would further earnestly urge the formation in each State and Territory of a centennial organization, which shall in time see that county associations are formed, so that when the nations are gathered together in 1876 each Commonwealth can view with pride the contributions she has made to the national glory.

Confidently relying on the zeal and patriotism ever displayed by our people in every national undertaking, we pledge and prophecy that the Centennial Celebration will worthily show how greatness, wealth and intelligence can be fostered by such institutions as those which have for one hundred years blessed the people of the United States.

JOSEPH R. HAWLEY, *President*,
LEWIS WALN SMITH, *Temporary Secretary*.

The Ferris Bringhurst Memorial Fountain.—The following, which we clip from the "Delaware Tribune," bears testimony that the unfortunate Ferris Bringhurst was as highly appreciated in his native city, Wilmington, as he was respected and beloved by a large circle of American pharmacists:

In memory of and respect for the late Ferris Bringhurst, who, when living, was always a leading and unpretentious spirit in some philanthropic work, principal among which was the Wilmington Fountain Society, a drinking fountain of beautiful design has been erected at the intersection of Delaware and Pennsylvania avenues.

The work of erection and finishing was completed November 15th. The base is of American gray granite, five feet high, while the column or shaft, eleven feet high, is of Aberdeen red granite, of Scotland, similar to that of which the Egyptian Obelisks were made, and said to be as durable, and will retain the bright polish for centuries.

The capitol is of gray granite, while the beautiful urn on the top is of red Aberdeen granite. On the east side of the base is the following inscription: "To the memory of Ferris Bringhurst, First President of the Wilmington Fountain Society." Another appropriate inscription, on the south side of the base, is: "Kindness to God's Creatures is a Service Acceptable to Him."

The work has been done entirely by private subscription with the exception

of a donation of \$250 voluntarily made by City Council, the lot being presented by Mr. J. Taylor Gause, and the city granting a free use of the water. The fountain complete was made by Struthers and Sons, of Philadelphia, at a cost of about \$2000. The enclosure is yet to be neatly paved, and will have a neat iron railing of a light pattern when finished.

The work is an appropriate memorial of one whose works were so charitable and benevolent, and at the same time so disinterested and unassuming.

Pharmaceutical Colleges and Associations.

THE COLLEGES OF PHARMACY in the United States have larger classes during the present session than ever before. The Philadelphia College of Pharmacy has within the last seven years more than doubled the number of its students, and all other Colleges show similar marks of prosperity—a sure sign that the value of the scientific education of pharmacists is being more appreciated now than heretofore.

THE NEW YORK COLLEGE OF PHARMACY have arranged monthly conversational lectures, which will be delivered by Mr. P. Balluff, Dr. E. R. Squibb and Professors Day and Chandler.

THE LOUISVILLE COLLEGE OF PHARMACY has received a donation to its cabinet from Messrs. E. Sachsse & Co., Leipzig, Germany, of 19 specimens of fine essential oils. The Board of Trustees, at their meeting of Dec. 16th, instructed the Corresponding Secretary, by a unanimous vote, to tender, through the "American Journal of Pharmacy," their cordial thanks to the said firm for its valued gift.

WM. G. SCHMIDT, *Corresponding Sec'y.*

THE FACULTY OF THE CALIFORNIA COLLEGE OF PHARMACY has been constituted as follows: Max Tschirner, professor of Chemistry; Wm. T. Wenzell, professor of Pharmacy; Wm. Searby, professor of Materia Medica, and H. H. Behr, M. D., professor of Botany.

THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN held a pharmaceutical meeting Dec. 4th, Mr. A. F. Haselden presiding.

Professor BENTLEY drew the attention of the meeting to a section of the baobab-tree, which had been forwarded to the Society by Mr. Baynes, who was formerly the artist of the Livingstone expedition. Mr. Baynes stated that the bark was used as a substitute for quinia. In most manuals treating of the properties and uses of plants, the bark of the baobab-tree was reputed to be used medicinally, and as an authentication of that, Mr. Baynes' contribution was of value.

Dr. PAUL asked the attention of the meeting to a table which had been forwarded by Mr. Ekin, of Bath, in which the nutritive values of various articles of food were represented on the basis of the respective percentage of carbon and nitrogen. This mode of valuation was somewhat hypothetical, but it afforded a fair ground of comparison between different articles of food within certain limitations. The table was constructed in such a way as to show these comparative values graphically. Though the use of graphic formulæ in chemistry were not to be recommended or regarded as very serviceable, he thought that in a case

like the present, and within certain limits, a table of that kind with the graphic method of representing fact might be of use.

Professor REDWOOD called attention to an apparatus which had been placed in the room for the inspection of the members. It was a form of apparatus which was very generally used by pharmacists in Germany, and had at his suggestion been imported by Messrs. Zimmermann & Co., of the City. The apparatus provided in a small compass means for conducting the various pharmaceutical operations of boiling, distilling, infusing, digesting, etc.

Mr. COOPER exhibited a specimen of effervescing lozenges, which, he said, he had been some years endeavoring to produce. He was in hopes that by means of these lozenges certain medicines might be administered in a more pleasant way than by the present methods.

Professor REDWOOD remarked that Mr. Cooper seemed to have made an important step in the direction of elegant pharmacy.

Mr. COOPER added that if these lozenges had been produced twenty years ago, homœopathy would not have held its own.

Mr. WOORON described several specimens of French elegant pharmacy, which, he observed, were perhaps not very important, though interesting for the excellent manner in which they were made. Among those he referred especially to some sulphovinate of soda (prepared as described in the *Pharmaceutical Journal* of last June.) There was also on the table a drop measure, which he said was the neatest thing he had ever seen, and was mathematically correct. The section of the tube was three milligrams in diameter. There was also a table showing the number of drops to the gram of various liquids, varying from water 20 drops, to ether 98 drops to the gram.

Mr. WILLIAMS said that within the last two months considerable demand had arisen for croton chloral hydrate, which, although not a new thing, having been introduced two years ago, had not hitherto been much used in medical practice in this country. It was stated to be of great value in nervous diseases affecting the face. It was made by passing dry chlorine into aldehyde, but the first experiments failed; it was found to be a very difficult body to manufacture, in consequence of the bad quality of the aldehyde. That prepared by the process usually given was a very impure body, and, in fact, quite unfit for the purpose of making croton chloral. He had, therefore, brought a specimen of what he believed to be nearly pure aldehyde, a thing he had never seen before, and of which he thought few in the room had any knowledge. It was a powerful body, and probably might be recommended for medicinal use. In the first place, it had great affinity for oxygen. If a stoppered bottle were half filled with it and left for a short time, the stopper would be held so tight that there would be a difficulty in removing it, for the whole of the oxygen left in that portion of the bottle was absorbed by the aldehyde. They knew very well that the spirits of nitre was a very favorite remedy. The Edinburgh Pharmacopœia a few years ago ordered spirits of nitre to be made with nitrite of ethyl. He believed he was right in saying that that preparation did not give satisfaction, and was not looked upon as a good medicinal article. An opinion had been held that aldehyde played an important part in the medicinal action of spirits of nitre. Medical men could now determine for themselves whether aldehyde had any important medicinal action or not, but if they breathed this specimen,

he thought they would agree with him that it was likely to be a very potent one indeed. Speaking theoretically, he thought it ought to prove one of the most powerful anaesthetics known. The croton chloral hydrate smells of lemon. It is formed by two molecules of aldehyde, less one molecule of water, the three atoms of hydrogen being replaced by three atoms of chlorine; croton chloral was the result, the hydrate forming the beautiful crystalline body before them.

The following papers were then read and discussed: Apparatus for Macerating, by Mr. R. W. Giles; On the Extracts containing Chlorophyll, by Mr. J. B. Barnes: A Dispensing Note on Chloral Hydrate, by Mr. J. G. Plumer; On Sulphuretted Antimony, Official and Commercial, by Mr. J. Moss.

THE NORTH BRITISH BRANCH OF THE PHARMACEUTICAL SOCIETY opened its new rooms on November 22d. The president, Mr. H. C. Baildon, delivered the introductory address, after which Mr. J. Mackay read a paper on Pharmaceutical Education, which elicited an animated discussion. A number of specimens and books were presented to the museum and library, both of which are being made available to all connected with the society every day from 10 A. M. till 4 P. M., and, Saturdays excepted, in the evening from 6 till 10 o'clock.

PHARMACEUTICAL SOCIETY OF PARIS.—Mr. Stan. Martin presided at the meeting held October 2d. After the presentation of books and specimens, Mr. Méhu read several extracts from English and American journals, treating of the means to avoid mistakes in dispensing.

Mr. Marais exhibited specimens of orange-flower water, made by distillation with steam, and preserved for 12 years; distilled over the naked fire, it cannot be kept for that length of time. His method of preparation is to pass a jet of steam into Soubeiran's alembic, containing a mixture of equal weights of flowers and hot water. Mr. Martin stated that this distilled water, if well prepared, yields to chloroform a very agreeable odorous principle.

Mr. Roucher showed several varieties of oxide of lead, of a yellow, bronze, black and red purple color, the latter being obtained by acting upon the hydrated oxide with a rather concentrated solution of caustic potassa.

Mr. Planchon exhibited English rhubarb as found in French commerce; though resembling to some extent Chinese rhubarb, it is readily distinguished from it by being less marbled upon the fracture and by the absence of the diamond shaped meshes upon the surface; it is probably obtained from *Rheum rhaponticum*. A new kind of rhubarb from the Amoor river, which possesses the characters of a medium quality of Chinese rhubarb, sells in London at 4 to 6 francs per kilogram. Mr. Marais stated that for some time, Austrian rhubarb was endeavored to be introduced into commerce.

Mr. Lebaigne read a paper on the best means to avoid mistakes in pharmacies, which created a long discussion, the subject being at last postponed to the next meeting.

Minutes of the Philadelphia College of Pharmacy.

A stated meeting of the College was held December 30th, 1872, Dillwyn Parrish, President, in the chair; 14 members present. The minutes of the last

meeting were read and approved. The minutes of the Board of Trustees were read by Wm. C. Bakes, Secretary of the Board, and approved.

The minutes of the Board inform that the Alumni Association had transferred to the College the fixtures and apparatus of the School of Practical Chemistry and Pharmacy.

The Committee on Deceased Members reported progress with the memoir of Prof. Parrish.

W. C. Bakes reported further acknowledgments of the reception of the certificates of honorary and corresponding membership. The letter of Carl Fredericking, of Riga, was referred to the Corresponding Secretary, to be answered.

On motion, the Board of Trustees were directed to effect an insurance on the fixtures and apparatus of the School of Practical Chemistry.

On motion, then adjourned.

CHARLES BULLOCK, *Secretary.*

Minutes of the Pharmaceutical Meetings.

A Pharmaceutical Meeting was held December 17th, 1872, Prof. Procter in the chair; William McIntyre, in the absence of the Registrar, acting as Registrar pro tem:

The minutes of the last meeting were read and approved, after correcting the price of ceresin to 46 cents gold per lb.

Mr. Shinn introduced Prof. Markoe of Boston, and presented, in behalf of Thos. H. McAllister, to the College various volumes of the American Journal of Pharmacy.

Prof. Maisch read a paper on impurities in ladies' slipper root* and exhibited preserved specimens of roots and flowering plants of *Cypripedium pubescens*, *C. parviflorum* and *C. acaule*; also commercial samples of pure cypripedium, and some admixed with hydrastis, senega and other dicotyledonous roots.

In answer to a question by Mr. Shinn, Prof. Procter stated that there was considerable demand for cypripedium by eclectic physicians, who use it in such cases in which valerian is indicated.

Mr. Remington read a paper on ceresin† and exhibited a sample of simple cerate prepared from it. Nothing can be said as yet about its keeping qualities, the time being too short. It was remarked that cerate prepared from paraffin quickly spoils, while yellow wax and benzoinated lard preserve it for a long time.

Mr. Shinn remarked that emulsions of codliver oil containing phosphate of lime were being prescribed by physicians, and asked the experience of those present in making emulsions containing large quantities of fixed oils. He had samples from two makers, both of which separate and became rancid after some time; the quantity of lime salt in both is stated in ambiguous terms. The fair method would be to state the quantity of phosphate of lime, lactic acid and codliver oil in a certain measure.

*See page 9 of the present number.

†Published on page 11 of this number.

Prof. Procter had used a mixture of tragacanth and acacia in proportion of 1 to 6, and the product is rather thick.

Prof. Maisch said one maker of this emulsion has lately obtained a patent, which, however, is probably of no value. As early as 1855 he prepared emulsions containing 50 per cent of codliver oil, with alkalies and alkaline earths,* which may be sweetened and flavored to taste. This is not a true emulsion, but a partial saponification.

Mr Shinn had used lime water, 2 ounces to a pint, in conjunction with gum arabic; also sucrate of lime, by means of which a 75 per cent emulsion can be prepared and mixed with syrup of phosphate of lime and lactic acid.

Mr. Remington remarked he had seen a communication from an attorney threatening certain parties with prosecution for infringement of patent if they did not desist in the manufacture of this preparation; but apparently the threat would not be carried out.

Prof. Maisch said a method is much needed whereby fixed oils can be emulsified as readily as volatile oils, ether and chloroform are by the method of J. W. Forbes.†

Mr. Shinn had seen a patent churn in use as a labor saving agent where large quantities of emulsions are used.

Prof. Maisch presented a well made sample of benzoinated oxide of zinc ointment, prepared by A. H. Bolton in a paint mill.

Mr. Boring exhibited cucumber ointment in good condition, made in 1868, by the method as modified from the French formula by Prof. Procter,‡ who having tried various methods stated that with this one success depends upon time and patience properly expended upon it.

Prof. Markoe, at the suggestion of Mr. Shinn, addressed the meeting and spoke about his recent visit to England, describing several of what may be termed representative pharmaceutical establishments of Great Britain which he visited in Liverpool, Harrowgate, Leeds, Newcastle, Edinburgh, London, &c. The proprietors rarely reside in the same building in which the business is carried on, but if the number of employees is sufficiently large a housekeeper is usually employed, the clerks residing and taking their meals on the premises. The current literature, especially scientific, and a well-selected library is not unfrequently met with, the clerks having access to it in the evening. In some stores apprentices are never employed, only qualified assistants, those acting as dispensers, having their separate counters, each with complete apparatus and appurtenances, as for instance in Mr. Abraham's store, in Liverpool, where there are four dispensing counters. The precautions against mistakes with poisons, adopted by several British pharmacists, were mentioned, and a description was given of the alkali works at Newcastle-on-Tyne. The speaker then spoke about the Brighton Meeting of the British Pharmaceutical Conference, at which he was present, and said that the attendance was not as large as that at the meetings of the American Pharmaceutical Association, if the membership and the short distances which the British pharmacists have to travel is

* See American Journal of Pharmacy, 1856, p. 1.

† See American Journal of Pharmacy, 1872, p. 61.

‡ See American Journal of Pharmacy, 1853, p. 409.

taken into consideration. Percolation, which is well understood and so indispensable here, is little known and practised there. The speaker's impression is that the British pharmacists, as a class, at least in the larger cities, are chemists and men of education, but that galenical pharmacy is better understood here.

The meeting then adjourned.

WILLIAM MCINTYRE,
Registrar pro tem.

Editorial Department.

THE TWENTY-FIRST ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION will take place September 16th next, in the city of Richmond, Va. We have already received many letters announcing the intention of pharmacists residing in different parts of the country, to be present on that occasion, so that even at this early date the prospects for a full attendance are very flattering; and we desire to direct the attention of our friends in the Southern States to this, so that they may make timely arrangements to be present. The Local Secretary is Mr. Thos. H. Hazard, Richmond, Va.

PHARMACEUTICAL LEGISLATION.—We have received information that efforts will be made again in several States to have suitable laws enacted with the view of regulating the practice of pharmacy. The laws which are now in force in five or six States have already had a very beneficial effect in preventing incompetent persons from becoming proprietors of stores, or from acting in the capacity of assistants. An important result of this movement has been that more importance is now attached to the proper education of the young pharmacists, and that the facilities of acquiring pharmaceutical knowledge have been considerably increased of late years. A conscientious enforcement of the laws, where such exist, must result in still greater and lasting benefit to our profession, as well as to the public in general. There are some who may feel aggrieved by violations of the law; it will not be sufficient for them to merely complain about its inefficiency, but they should endeavor to furnish proper and sufficient proof to the authorities, so that the offending parties may be prosecuted. We have received two complaints, such as we have referred to, from within the city limits of Philadelphia, and it is very probable that similar conditions may exist in other localities where pharmaceutical laws have been passed. It is not only to the pecuniary, but also to the professional interest of every pharmacist, that the efficiency and the usefulness of such laws should be thoroughly tested, before modifications are demanded.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Proceedings of the Fourth Annual Meeting of the California Pharmaceutical Society, held at San Francisco, October, 1872. Also, the Constitution, By-Laws and Roll of Members. San Francisco: A. L. Bancroft & Co., Printers. 1872. 8vo, pp. 66.

We have already reported on this meeting, on page 524 of our last number. It is gratifying to notice the flourishing condition of this Society, which has 135 active members on its roll.

Circular of Information of the Bureau of Education for March, 1872. Washington: Government Printing Office. 1872. 8vo.

It contains three interesting statistical papers, as follows: An Inquiry concerning the Vital Statistics of College Graduates; Distribution of College Students, in 1870-71; Facts of Vital Statistics in the United States, with tables and diagrams.

CATALOGUE

OF THE

Class of the Philadelphia College of Pharmacy,

FOR THE FIFTY-FIRST SESSION, 1872-73.

With a List of their Preceptors and Localities.

MATRICULANTS.	TOWN OR COUNTY.	STATE.	PRECEPTOR.
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Alvarez, Miguel.	Ciencuegus,	Cuba.	Ernest Triolet.
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Apple, A. A.	Hellertown,	"	J. Van Buskirk, M.D.
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Raser, A. P.	Reading,	"	
Reed, Edward A.	Mendota,	Illinois.	J. T. White.
Reichel, E. B.	Nazareth,	Pennsylvania.	B. N. Bethel, M.D.
Reimensnyder, M. F.	Sunbury,	"	P. A. Grosh.
Ritter, Eugene D.	Easton,	"	Bernheimer & Kerlin.
Roeder, J. E.	Hosensack,	"	— Rosenberger, M.D.
Roepper, F. A.	Bethlehem,	"	D. S. Jones.
Rohn, A. B.	Easton,	"	H. F. Bucher.
Rowand, A. H. C.	Philadelphia,	"	Robert Simpson.
Rowe, J. M.	Tarboro,	North Carolina.	Charles Shivers.
Rowley, Isaac H.	Philadelphia,	Pennsylvania.	Hance, Bros. & White.
Royer, P. R.	Akron,	"	J. Koningmacher.
Royston, J. L.	Lancaster,	Kentucky.	W. H. Rinker.
Ruggles, Dexter L.	Williamsport,	Pennsylvania.	Wm. D. Harrison.
Russell, George M.	Philadelphia,	"	Wm. R. Warner & Co.
Salvador, John H.	"	"	E. P. Bernardy, M.D.
Sanborn, Gust. A.	"	"	Sanborn & Butler.
Savage, Frank S.	"	"	J. R. Angney, M.D.
Schmidt, Henry,	Cincinnati,	Ohio.	C. C. Spannagel.
Schnabel, Charles,	New York,	New York.	J. F. Conway, M.D.
Sher, F. P.	Philadelphia,	Pennsylvania.	J. W. Dallam & Co.
Smith, A. E.	Williamsburg,	Virginia.	L. Henley, M.D.
Smith, Cyrus P.	Lebanon,	Pennsylvania.	V. B. Allwein, M.D.
Smith, Theodor,	Baltimore,	Maryland.	
Smith, Milnor,	Philadelphia,	Pennsylvania.	John M. Maris & Co.
Smith, O. L.	Columbus,	Georgia.	A. M. Brannon.
Smith, Rush B.	Norristown,	Pennsylvania.	C. Ellis, Son & Co.
Sparrow, Charles,	Leavenworth,	Kansas.	E. Parrish & Son.
Spence, Samuel B.	Fond du Lac,	Wisconsin.	Kalk & Kent.
Spriggs, J. S.	Monmouth,	Illinois.	Spriggs & Bro.
Stansbury, Wilson,	Mechanicsburg,	Pennsylvania.	Thomas H. Franklin.
Stern, W. N.	Easton,	"	T. A. Walke.
Stewart, A. B.	Philadelphia,	"	W. F. Simes & Son.
Stewart, R. Reed,	"	"	E. C. Jones.
Stoner, W. J.	Harrisburg,	"	R. W. Richie.
Stifel, Albert F.	Wheeling,	West Virginia.	S. Mason M. Collin.
Straw, J. I.	Philadelphia,	Pennsylvania.	H. D. Straw.
Swearingen, W. W.	Decatur,	Illinois.	Hubbard & Swearingen.
Tatem, Charles H.	Philadelphia,	Pennsylvania.	Alfred Tatem.
Terrell, Thomas,	"	"	P. D. Woodhouse.
Tilton, Francis,	Easton,	"	H. B. Lippincott.
Timmins, Chas. F.	Easton,	"	Jas. G. Wells.
Tomlin, Millard F.	Glassboro,	New Jersey.	D. Hershey.
Townsend, Henry G.	Philadelphia,	Pennsylvania.	Powers & Weightman.
Trimble, Henry,	Chester,	"	S. Mason McCollin.
Truckenmiller, G. L.	Petersburg,	Illinois.	F. Zerman, M.D.
Thorpe, Benjamin,	Woodbury,	New Jersey.	C. Ellis, Son & Co.
Van Cise, Isaac P.	Mount Pleasant,	Iowa.	Van Cise & Lyon.
Voshage, Herman F.	Ashland,	Pennsylvania.	W. Krause.
Walker, Samuel E.	Philadelphia,	"	John T. Walker.
Wallace, James,	"	"	J. M. Maris & Co.
Weigle, Gilbert H.	Mechanicstown,	Maryland.	G. M. Zimmerman, M.D.
Werner, J. E.	Philadelphia,	Pennsylvania.	Bean & Stevenson.
Wert, John M.	Sellersville,	"	H. A. Bower.
West, Wm. H.	Philadelphia,	"	Powers & Weightman.
White, W. G.	Lexington,	Kent.	J. B. Morton & Co.
Whitman, J. O.	Canton,	Pennsylvania.	W. W. Whitman.
Wiegner, J. Adam,	Bethlehem,	"	M. M. Selfridge & Co.
Willard, R., Jr.	Haddonfield,	New Jersey.	I. A. Braddock.
Williams, Jno. L.	Philadelphia,	Pennsylvania.	C. A. Weideman.
Williams, R. J. C.	Greenwich,	New Jersey.	J. W. Simpers.
Wills, Charles J.	Philadelphia,	Pennsylvania.	Bullock & Crenshaw.
Wilson, Lewis H.	"	"	D. Wittberger.
Wittkamp, Henry L. Jr.	Hannover,	Germany.	D. Wittkamp.
Wood, James P.	Harrington,	Delaware.	W. B. Thompson.
Yarnall, Benj. D.	Philadelphia,	Pennsylvania.	A. H. Yarnall & Co.
Yergin, Frank P.	Wooster,	Ohio.	C. W. Searly, M.D.
Young, John K.	Doylestown,	Pennsylvania.	Jas. P. Milnor.
Yost, James L.	Wilkesbarre,	"	Jas. T. Shinn.
Ziegler, J. Walter,	Sunbury,	"	C. Souder, M.D.
Zimmerman, G. A.	Johnstown,	"	Jos. Abel.